

What is claimed is:

1. A method for transferring nucleic acids of interest into competent host cells, comprising the steps of:

5 (a) mixing competent host cells suspended in a substantially non-ionic solution comprising at least one sugar or sugar derivative with the nucleic acids of interest; and

(b) subjecting the host cells to an electrical treatment, thereby permitting the transfer of the nucleic acids of interest into the bacterial cells.

10 2. The method of claim 1, wherein the non-ionic solution further comprises glycerol or dimethyl sulfoxide.

15 3. The method of claim 1, wherein the host cells are gram-negative bacterial cells.

4. The method of claim 3, wherein the gram-negative bacterial cells are *E. coli*.

20 5. The method of 1, further comprising the step of culturing the transformed cells in a selected media capable of promoting their growth.

6. The method according to claim 1, wherein the concentration of the sugar or derivative is in the range of about 0.1% to about 5%.

7. The method according to claim 1, wherein the sugar or sugar derivative is
5 sorbitol in a concentration range of about 2.0 to about 2.5%.

8. The method according to claim 1, wherein the sugar or sugar derivative is an aldose.

10 9. The method according to claim 8, wherein the aldose is selected from the group consisting of monosaccharides, disaccharides, trisaccharides, and oligosaccharides.

15 10. The method according to claim 1, wherein the sugar or sugar derivative is an aldose alcohol.

11. The method according to claim 10, wherein the aldose alcohol is selected from the group consisting of erythritol, sorbitol, and mannitol.

20 12. The method according to claim 1, wherein the sugar or sugar derivative is a ketose.

13. The method according to claim 12, wherein the ketose is selected from the group consisting of dihydroxyacetone, erythrulose, ribulose, xylulose, psicose, fructose, sorbose, and tagatose.

5 14. The method according to claim 1, wherein the sugar or sugar derivative is an aminosugar.

10 15. The method according to claim 14, wherein the aminosugar is selected from the group consisting at least one of glucosamine, galactosamine, N-acetylglucosamine, N-acetylgalactosamine, muramic acid, N-acetyl muramic acid, and sialic acid.

15 16. The method according to claim 1, wherein the sugar or sugar derivative is a glycoside.

17. The method according to claim 16, wherein the glycoside is selected from the group consisting of glucopyranose and methyl-glucopyranose.

20 18. The method according to claim 1, wherein the sugar or derivative thereof is a lactone.

19. The method according to claim 18, wherein the lactone is gluconolactone.

20. The method according to claim 1, wherein the non-ionic solution comprises
a mixture of sugars and sugar derivatives.

5 21. An electroporation kit comprising transformation competent cells
suspended in a substantially non-ionic solution comprising at least one sugar or sugar
derivative.

10 22. The kit according to claim 21, wherein the transformation competent cells
are gram-negative bacterial cells.

15 23. The kit according to claim 21, wherein the bacterial cells are *E. coli*.

20 24. The kit according to claim 21, wherein the concentration of the sugar or
derivative thereof is in the range of about 0.1% to about 5%.

25 25. The kit according to claim 1, wherein the sugar or sugar derivative is
sorbitol in a concentration range of about 2.0 to about 2.5%.

20 26. The kit according to claim 21, wherein the sugar or sugar derivative is an
aldose.

27. The kit according to claim 26, wherein the aldose is selected from the group consisting of monosaccharides, disaccharides, trisaccharides, and oligosaccharides.
- 5 28. The kit according to claim 21, wherein the sugar or sugar derivative is an aldose alcohol.
- 10 29. The kit according to claim 28, wherein the aldose alcohol is selected from the group consisting of erythritol, sorbitol, and mannitol.
- 15 30. The kit according to claim 21, wherein the sugar or sugar derivative is a ketose.
- 20 31. The kit according to claim 30, wherein the ketose is selected from the group consisting of dihydroxyacetone, erythrulose, ribulose, xylulose, psicose, fructose, sorbose, and tagatose.
32. The kit according to claim 21, wherein the sugar or sugar derivative is an aminosugar.

33. The kit according to claim 32, wherein the aminosugar is selected from the group consisting at least one of glucosamine, galactosamine, N-acetylglucosamine, N-acetylgalactosamine, muramic acid, N-acetyl muramic acid, and sialic acid.

5 34. The kit according to claim 21, wherein the sugar or sugar derivative is a glycoside.

10 35. The kit according to claim 34, wherein the glycoside is selected from the group consisting of glucopyranose and methyl-glucopyranose.

15 36. The kit according to claim 21, wherein the sugar or derivative thereof is a lactone.

37. The kit according to claim 36, wherein the lactone is gluconolactone.

15 38. The kit according to claim 21, wherein the non-ionic solution comprises a mixture of sugars and sugar derivatives.